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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/824,335

04/14/2004

Osamu Shinkawa

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HARNESSE, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER

MARTIN, LAURA E

ART UNIT

PAPER NUMBER

2853

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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31 DAYS

12/22/2006

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/824,335

Applicant(s)

SHINKAWA ET AL.

Examiner

Laura E. Martin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38, 40-55 and 57-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-38, 40-55 and 57-61 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

This application contains claims directed to the following patentably distinct species:

Species I, drawn to a diaphragm, an actuator for displacing the diaphragm, a cavity filled with a liquid, a nozzle communicated by the cavity, a driving circuit, a residual vibration detecting means, a pulse generating means, computation means, time measuring means, head failure judging means, and switching means (for example, as presently disclosed in claims 1 and 3-49); and

Species II, drawn to a diaphragm, an actuator which changes the internal pressure of the cavity to eject a liquid in the form of droplets through a nozzle, a driving circuit, a residual vibration detecting means, a pulse generating means, computation means, time measuring means, head failure judging means, and switching means (for example, as presently disclosed in claims 2, 53-55, and 57-60); and

Species III, drawn to a detecting a residual vibration of a diaphragm displaced by an actuator in a droplet ejection head after carrying out a droplet ejection operation, generating reference pulses, carrying out the operation for the number of reference pulses on the basis of the residual vibration of the diaphragm, measuring the lapsed time, and judging head failure means (for example, as presently disclosed in claims 50 and 52); and

Species IV, drawn to detecting a residual vibration of an electromotive voltage generated from an actuator in a droplet ejection head after carrying out a drop generation operation by the driving circuit, generating reference pulses, carrying out an operation for the number of reference pulses, measuring a lapsed time since the actuator has been driven by the driving circuit, and judging a head failure means (for example, as presently disclosed in claims 51 and 61)

The species are independent or distinct because each species holds unique limitations that lead to a burdensome search.

If applicant elects Species I for examination, there is a need to further restrict between claims 1 and 3-49.

The application contains claims directed to the following patentably distinct sub-species of the claimed invention:

1. Sub-species 1a, drawn to the predetermined time period is a time period until the residual vibration is generated after driving the actuator (for example, as presently disclosed in claim 8).

Sub-species 1b, drawn to the predetermined time period is a time period corresponding to a first half cycle of the residual vibration (for example, as presently disclosed in claim 9).

Sub-species 1c, drawn to the predetermined time period is a time period corresponding to a first one cycle of the residual vibration (for example, as presently disclosed in claim 10).

2. Sub-species 2a, drawn to the head failure judging means judging the present or absence of the head failure in the droplet ejection heads and cause thereof on the basis of the computation result by the computation means and lapsed time (for example, as presently disclosed in claim 11).

Sub-species 2b, drawn to head failure judging means judging a cause of the head failure on the basis of the count value held by the holding means and the lapsed time (for example, as presently disclosed in claim 12).

3. Sub-species 3a, drawn to a head failure judging means judging that too much paper dust is adhering to the vicinity of the outlet of the nozzle when the count value is smaller than a third count threshold and the lapsed time is smaller than a first time threshold (for example, as presently disclosed in claim 15).

Sub-species 3b, drawn to a head failure judging means judging that little paper dust is adhering to the vicinity of the outlet of the nozzle when the count value is in the range between a second count threshold and a third count threshold and the lapsed time is smaller than a first time threshold (for example, as presently disclosed in claim 16).

Sub-species 3c, drawn to a head failure judging means judging head failure does not occur when the count value is in the range between a first count threshold and a second count threshold and the lapsed time is smaller than a first time threshold (for example, as presently disclosed in claim 17).

Sub-species 3d, drawn to a head failure judging means judging that too much paper dust is adhering to the vicinity of the outlet of the nozzle when the count value is smaller than a third count threshold and the lapsed time is in a range between a first time threshold and a second time threshold (for example, as presently disclosed in claim 18).

Sub-species 3e, drawn to a head failure judging means judging that the liquid in the vicinity of the nozzle has thickened due to drying as a cause of head failure when the held count value is in the range between a second count threshold and a third count threshold and the lapsed time is in the range between the first and second time thresholds (for example, as presently disclosed in claim 19).

Sub-species 3f, drawn to a head failure judging means that judges that head failure does not occur in the case when the count value is between the first and second count thresholds and the lapsed time is in the range between the first and second time thresholds (for example, as presently disclosed in claim 20).

Sub-species 3g, drawn to a head failure judging means that judges that the liquid in the vicinity of the nozzle has thickened due to drying as a cause of head failure when the held count value is smaller than a third count threshold and the lapsed time is larger than the second time threshold (for example, as presently disclosed in claim 21).

Sub-species 3h, drawn to a head failure judging means judging that little paper dust is adhering to the vicinity of the outlet of the nozzle when the count value is in a range between a second count threshold and a third count threshold and the lapsed

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time is larger than a second time threshold (for example, as presently disclosed in claim 22).

Sub-species 3i, drawn to a head failure judging means that judges that head failure does not occur in the case when the count value is between the first and second count thresholds and the lapsed time larger than a second time threshold (for example, as presently disclosed in claim 23).

4. Sub-species 4a, drawn to a recovery means carrying out the flushing process or the pump-suction process in the case where the head failure is the little thickening of liquid due to drying (for example, as presently disclosed in claim 26).

Sub-species 4b, drawn to recovery means carrying out the pump-suction process in the case where it is judged that the cause of the head failure is considerable thickening of the liquid due to drying (for example, as presently disclosed in claim 27).

Sub-species 4c, drawn to recovery means changing the number of ejections in the flushing process or a suction time of the pump in the pump-suction process according to the degree of thickening of the liquid due to drying and carries out the flushing process so the pump-suction process in the case where it is judged that the cause of the head failure is the thickening of the liquid (for example, as presently disclosed in claim 28).

Sub-species 4d, drawn to the recovery means carrying out the wiping process in the case where it is judged that the cause of the head failure is the adhesion of paper dust (for example, as presently disclosed in claim 29).

Sub-species 4e, drawn to the recovery means changing the number of wiping operations in the wiping process according to the degree of the adhesion of paper dust and carrying out the wiping process in the case where it is judged that the cause of the head failure is the adhesion of paper dust (for example, as presently disclosed in claim 30).

Sub-species 4f, drawn to the recovery means changing the number of wiping operations in the wiping process according to the degree of the ejection operations in the flushing process in response to the lapsed time and carries out the flushing process in the case where it is judged that the cause of the head failure is the little thickening of the liquid due to drying when the flushing process is to be carried out (for example, as presently disclosed in claim 31).

Sub-species 4g, drawn to the recovery means carrying out the pump-suction process in the case where the cause of the head failure is the intrusion of air bubbles (for example, as presently disclosed in claim 32).

Sub-species 4h, drawn to recovery means changing a suction time of the pump in the pump-suction process according to the computation result and carries out the pump-suction process in the case where it is judged that the cause of the head failure is the intrusion of the air bubbles (for example, as presently disclosed in claim 33).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species.

MPEP § 809.02(a).

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the

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record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

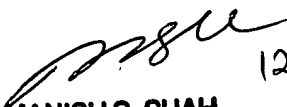
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura E. Martin whose telephone number is (571) 272-2160. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Laura E. Martin


12/13/06
MANISH S. SHAH
PRIMARY EXAMINER